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EXAMINER

RIDER, JUSTIN W

ART UNIT	PAPER NUMBER
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2626

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/624,092

Applicant(s)

RAPOPORT, EZRA J.

Examiner

Justin W. Rider

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is responsive to communications: Application filed 21 July 2003. Claims 1-60 are pending.

Double Patenting

2. Claims 53-54 and 57-58 of this application conflict with claims 1-5 of Application No. 10/679,954.

Both sets of claims are directed toward identifying principal components and generating text based on phonemes determined from said principal components.

37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

Specification

3. The disclosure is objected to because of the following informalities: It appears that the term 'MATHLAB' should be amended to --MATLAB-- in the following instances: P. 11, Line 10; P. 16, Line 10; and P. 18, Line 23.

Appropriate correction is required.

Claim Objections

4. Claim 13 is objected to because of the following informalities: Claim 13 appears that it should be dependent upon claim 12, not claim 10 as it currently stands, based on the claimed limitation regarding a smoothing filter. Claim 46, line 3, 'reconstructing' should be --reconstruct--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1 and 20 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: It is unknown where the coefficients to be sent came from. Where the examiner will interpret that the coefficients were determined from an input waveform by some method, one cannot assume that this is the case. A step should be included that accurately reflects the claimed invention.

Claim 21, 33, 36, 37, 49, and 52 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: It is unknown where the coefficients to be sent were generated or determined. Where the examiner will interpret that the coefficients were determined from an input waveform by some device or computer-readable instruction encoded on a computer-readable medium, one cannot assume that this is the case. A mention of the coefficient generation should be included that accurately reflects the claimed invention.

Claims 1, 20-21, 33, 36-37, 49, and 52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unknown and unclear where the data is being sent in each sending step, and in some cases from where data is being received. It is noted that limitations must clearly and definitely describe the claimed invention. It is necessarily vital to understand where data is coming from as well as where it is going. Simply sending data provides no indication to one having ordinary skill in the art how to recreate the claimed invention without undue experimentation.

Claims 17-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 17-18 recite the limitation "wherein reconstructing further comprises" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim since there is no reconstructing step in the independent claim.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1-60 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

To determine whether claims 1, 21 and 37 comply with the subject matter eligibility requirement of 35 U.S.C. 101, we ask:

i. does the claimed invention fall within one of the statutory classes? Yes, process and apparatus.

ii. does the claimed invention fall/cover/include a judicial exception? Yes, abstract idea (claim 37) – claim 37 is seemingly a patentable process or apparatus, however, it is in reality seeking patent protection of the computer program in abstract as evidenced by claims 1 and 21.

Once the answer of ii is a “yes”, continue to ask the following:

a) Is the claimed invention a practical application by physical transformation? No, while the parsing of an input waveform might imply the physical transformation of an input signal, it does not necessarily constitute a positive recitation of a signal being input to (e.g. by means of a transducer, etc...).

b) Is the claimed invention a practical application that produces a useful and *tangible* result? No, simply sending components or coefficients somewhere does not provide a definite result that is considered tangible. Within the context of the claimed limitation, the principal components and coefficients must be positively transferred in a meaningful way. In determining whether the claim is for a “practical application,” the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is “useful, tangible and concrete.”

If the answer to both a) and b) is no, then the claimed invention is non-statutory.

To determine whether claims 16, 33 and 49 comply with the subject matter eligibility requirement of 35 U.S.C. 101, the above rationale also applies, specifically with regards to b).

Wherein receiving a subset of principal components and coefficients does positively supply an input, the issue of tangibility applies to this instance as explained above. No

significant process is being performed on the received items and no tangible result is supplied to user.

Also, independent claims 20, 36 and 52 are also determined to be nonstatutory based on the combinations of the above reasoning. Also it is noted that none of the claims depending on the independent claims solve the issue of providing a final result in a way that would constitute tangibility and furthermore, a statutory invention.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 3, 5-8, 10-12, 21, 23, 25-28, 30-32, 37, 39, 41-44, and 46-48 are rejected under 35 U.S.C. 102(b) as being anticipated by **Atal (USPN 4,764,963)** referred to as **Atal hereinafter**.

Claims 1, 21, and 37: **Atal** discloses a method, apparatus and computer-readable medium for compressing speech data, comprising:

i. parsing an input waveform into pitch segments (col. 13, lines 22-27, 'comprise a succession of pitch period and voiced/unvoiced signals generated responsive to the voice message,');

ii. determining principal components of at least one pitch segment (col. 5, lines 33-35, 'the principal components $u_m(n)$ of the time frame is determined,');

iii. sending a subset of the determined principal components during an initial transmission period (Fig. 4 shows principal components being *sent* to a module in order to determine compact coefficients.); and

iv. sending coefficients (speech event feature signal) of the input waveform for each pitch segment during a period subsequent to the initial transmission period (col. 13, lines 5-8, 'coded speech event feature signals which are transmitted,').

Claims 3, 23, and 39: **Atal** discloses a method, apparatus and computer-readable medium as per claims 1, 21, and 37 above, further comprising:

- i. determining the number of pitch periods (col. 7, lines 45-48); and
- ii. generating a correlation matrix (col. 7, lines 57-58).

Claims 5, 25, and 41: **Atal** discloses a method, apparatus and computer-readable medium as per claims 1, 21, and 37 above, further comprising determining coefficients for each pitch period (col. 4, lines 2-10).

Claims 6, 26, and 42: **Atal** discloses a method, apparatus and computer-readable medium as per claims 1, 21, and 37 above, further comprising determining the validity of principal components (col. 8, lines 54-65, 'speech event timing parameter signal (created from principal components) are read from store **245** (box **505**) and zero crossings (centroids) therein are detected... whenever a zero crossing is found, the speech event location frame is stored,').

Claims 7, 27, and 43: **Atal** discloses a method, apparatus, and computer-readable medium as per claims 6, 26, and 42 above, wherein determining if the principal components are still valid comprises determining if a pitch segment exceeds a predetermined threshold (col. 8, lines 58-62, [zero crossings is the mark used to determine a valid set of signals]).

Claims 8, 28, and 44: **Atal** discloses a method, apparatus, and computer-readable medium as per claims 7, 27, and 43 above, wherein the predetermined threshold is a measure of a distance from a pitch segment to a centroid determined by the principal components (Abstract; col. 8, lines 50-52). Each negative going zero crossing represents the centroid, which, in turn, represents a predetermined threshold in which to determine the validity of signals.

Claims 10, 30 and 46: **Atal** discloses the method, apparatus and computer-readable medium as per claims 1, 21, and 37 above, further comprising reconstructing the input waveform (col. 13, lines 14-20).

Claims 11, 31, and 47: **Atal** discloses the method, apparatus and computer-readable medium as per claims 10, 30, and 46 above, further comprising:

i. scaling the principal components by the coefficients for each pitch segment to form scaled components (col. 11, lines 8-11, principal component signals $u(n)$ from box **620** are weighted to form signals...'); and

ii. summing the scaled components (col. 11, lines 15-24, '...the loop including boxes **605**, **610**, **615**, **620**, **625**, and **630** is iterated so that the complete sequence of speech events for the speech pattern is formed.' [emphasis added]).

Claims 12, 32, and 48: **Atal** discloses the method, apparatus and computer-readable medium as per claims 10, 30, and 46 above, wherein reconstructing further comprises

i. concatenating reconstructed components of the input waveform (col. 13, lines 55-60);
and

ii. using a smoothing filter while concatenating the reconstructed components (col. 13, lines 61-63).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 2, 16-18, 20, 22, 33-36, 38, and 49-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atal**.

Claims 2, 22, and 38: **Atal** discloses a method, apparatus and computer-readable medium as per claims 1, 21, and 37 above, however **Atal** discloses the use of five principal components (col. 9, lines 31-33) instead of six principal components. It would have been a suitable choice within the signal compression art to use five components as opposed to six components. Wherein applicant states that the number of ideal components (Specification, p. 15-16) would be between 5 and 10, it appears that the invention would perform equally well (>95% accuracy) with five principal components.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use five principal components for the reasons above.

Claims 16, 33, and 49: **Atal** discloses a method, apparatus, and computer-readable medium of receiving an input waveform. However, **Atal** fails to distinctly disclose the receiving of a subset of principal components and coefficients. **Atal** does however disclose the transmission of feature signals (col. 4, lines 61-64) that include the necessary components used

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to recreate the speech event feature signals (eqn. (5); col. 5, lines 41-60, e.g. principal components, u_m , and coefficients, b_{km}).

Therefore, it would have been inherent within the scope of invention to receive signal components if said components were transmitted after coding from a device.

Claims 17, 34, and 50: **Atal** discloses the method, apparatus and computer-readable medium as per claims 16, 33, and 49 above, further comprising:

i. scaling the principal components by the coefficients for each pitch segment to form scaled components (col. 11, lines 8-11, principal component signals $u(n)$ from box 620 are weighted to form signals...'); and

ii. summing the scaled components (col. 11, lines 15-24, '...the loop including boxes 605, 610, 615, 620, 625, and 630 is iterated so that the complete sequence of speech events for the speech pattern is formed.' [emphasis added]).

Claims 18, 35, and 51: **Atal** discloses the method, apparatus and computer-readable medium as per claims 16, 33, and 49 above, wherein reconstructing further comprises

i. concatenating reconstructed components of the input waveform (col. 13, lines 55-60); and

ii. using a smoothing filter while concatenating the reconstructed components (col. 13, lines 61-63).

Claim 20: Claim 20 is similar in scope and content to a combination of claims 1 and 16, and so therefore is rejected under the same rationale.

Claim 36: Claim 36 is similar in scope and content to a combination of claims 21 and 33, and so therefore is rejected under the same rationale.

Claim 52: Claim 52 is similar in scope and content to a combination of claims 37 and 49, and so therefore is rejected under the same rationale.

13. Claims 4, 14-15, 24, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atal** in view of **Chen et al. 'Karhunen-Loeve Method for Data Compression and Speech Analysis'**, pp. 377-380, October 1991 referred to as **Chen** hereinafter.

Claims 4, 24, and 40: **Atal** discloses a method, apparatus and computer-readable medium as per claims 1, 21, and 37 above, however failing to, but **Chen** does, specifically disclose ordering principal components (p. 377, Introduction, 'and ordered according to the magnitude of the associated eigenvalues.').

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include the teachings of **Chen** in the method of **Atal** because good quality intelligible speech can be reproduced along with a higher compression rate (Abstract).

Claim 14: **Atal** discloses a method as per claim 1 above, however failing to, but **Chen** does, further disclose reducing the principal components to reduce the number of bits transmitted (p. 379, 'After the DC value AV_i is removed from each component,').

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include the teachings of **Chen** in the method of **Atal** because good quality intelligible speech can be reproduced along with a higher compression rate (Abstract).

Claim 15: **Atal** discloses a method as per claim 1 above, however failing to, but **Chen** does, further disclose wherein an increased number of principal components to increase accuracy (p. 380, 'The largest ten eigenvalues ($M=10$) of the FB coefficients covariance matrix constitute

99.3% of the sum of the total 34 eigenvalues.'). This demonstrates a near perfect accuracy wherein 10 components are taken as opposed to six components. Applicant discloses in the specification (P. 15-16) that using between 5 and 10 principal components would allow a 95% reconstruction, wherein **Chen** is achieving 99.3%.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include the teachings of **Chen** in the method of **Atal** because good quality intelligible speech can be reproduced along with a higher compression rate (Abstract).

14. Claims 9, 29, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atal** in view of **Takebayashi et al. (USPN 5,761, 639)** referred to as **Takebayashi** hereinafter.

Claims 9, 29, and 45: **Atal** discloses a method, apparatus and computer-readable medium as per claims 7, 27 and 43 above, however failing to, but **Takebayashi** does, distinctly disclose the updating of principal components based on a predetermined criteria. **Atal** does disclose the use of thresholds to determine validity of principal component based samples, however **Atal** merely stores certain components. **Takebayashi**, in an analogous art, discloses the updating of principal components for different words (i.e. significantly different speech patterns) (col. 12, lines 47-52).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include the teachings of **Takebayashi** in the systems of **Atal** because it provides an efficient method of recognizing speech in noisy or non-ideal environments in order to transmit a higher quality of speech signal to be reconstructed at the output (col. 1, lines 20-35).

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15. Claims 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atal** in view of **Martin, R, 'Noise Power Spectral Density Estimation Based on Optimal Smoothing and Minimum Statistics', IEEE Transactions on Speech and Audio Processing, p. 504-512, 07/2001** referred to as **Martin** hereinafter.

Claims 13 and 19: **Atal** discloses a method for speech processing as per claims 10 and 18 above. However, where **Atal** further discloses the step of smoothing a signal so as to reduce discontinuities within a reconstructed signal, **Atal** fails to, but **Martin** does, disclose the use of a first-order (alpha-blending) filter in order to perform smoothing on a speech signal (p. 505, also eqn. 3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include the teachings of **Martin** in the method of **Atal** because the system minimizes speech distortions and unnatural sounding background noises which plague speech processes under adverse conditions (p. 504, Introduction).

16. Claims 53 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atal** in view of **Baker (USPN 4,713,778)** referred to as **Baker** hereinafter.

Claims 53 and 57: **Atal** discloses a method as per claims 1 and 16 above, however failing to, but **Baker** does, distinctly disclose comparing principal components generated from an input waveform to a set of prestored speech patterns (col. 8, line 64 – col. 9, line 2) in order to recreate speech or text.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include the teachings of **Baker** in the method of **Atal** because this reduces both computational cost and memory cost (col. 9, lines 1-2).

17. Claims 54 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atal** in view of **Baker** as applied to claims 53 and 57 above, and further in view of **Carleton et al.** (USPN 6,069,940) referred to as **Carleton** hereinafter.

Claims 54 and 58: **Atal**, in view of **Baker** discloses the methods as per claims 53 and 57 above, however failing to, but **Carleton** does, disclose wherein phonemes are generated and converted from speech to text (col. 4, lines 24-38).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include the teachings of **Carleton** in the method of **Atal** in view of **Baker** because it provides an increased method for navigating through telephone prompting systems (col. 2, lines 4-10).

18. Claims 55-56 and 59-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atal** in view of **Farrett** (USPN 5,636,325) referred to as **Farrett** hereinafter.

Claims 55 and 59: **Atal**, in view of **Baker** discloses the methods as per claims 53 and 57 above, however failing to, but **Farrett** does, disclose wherein phonemes are generated and used to produce natural speech (Abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include the teachings of **Farrett** in the method of **Atal** because it produces speech

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from many different dialects (intonations) while minimizing storage requirements (col. 3, lines 23-25).

Claims 56 and 60: **Atal**, in view of **Baker** discloses the methods as per claims 53 and 57 above, however failing to, but **Farrett** does, disclose wherein speech parameters are altered in order to change intonations (dialects) according to user preferences (Abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include the teachings of **Farrett** in the method of **Atal** because it produces speech from many different dialects (intonations) while minimizing storage requirements (col. 3, lines 23-25).

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. **Brewster et al. (USPN 6,070,133)**, **Guberman (USPN 6,138,089)**, **Scott et al. (USPN 5,025,471)** use pitch periods and/or principal component analysis techniques for signal compression/decompression; **Narayan (USPN 5,490,234)** uses waveform concatenating for signal reconstruction; **Kuhn et al. (USPN 6,327,565)** utilizes eigenvoices with respect to speech signals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin W. Rider whose telephone number is (571) 270-1068. The examiner can normally be reached on Monday - Friday 7:30AM - 5:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

J.W.R.
22 March 2007



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